

## Optimization of ultrasound-assisted extraction (UAE) of (poly)phenolic compounds from blueberry (*Vaccinium myrtillus*) leaves using full-factorial design

Nebojša VASILJEVIĆ\*,<sup>1,2</sup> Vladan MIČIĆ,<sup>1</sup> Mitar PERUŠIĆ,<sup>1</sup> Milorad TOMIĆ,<sup>1</sup> Sanja PANIĆ,<sup>2</sup>  
and Duško KOSTIĆ<sup>1</sup>

<sup>1</sup>*Faculty of Technology, University of East Sarajevo, Zvornik, Republic of Srpska, Bosnia and Herzegovina*

<sup>2</sup>*Faculty of Technology, University of Novi Sad, Novi Sad, Serbia*

**Abstract.** In this work, the influence of process parameters (temperature: 25 - 65 °C, ethanol content in the extraction solvent: 30 - 90 vol.%, and solid-to-solvent ratio: 1:15 - 1:45 w/v) on the process of ultrasound-assisted extraction (UAE) of (poly)phenols from blueberry leaves (*Vaccinium myrtillus*) was investigated. Statistical analysis was performed using the MINITAB 21 software, with the application of three-level full factorial designs. The Responses in the study are the content of total (poly)phenols, flavonoids and anthocyanins in the obtained extracts. The extraction of blueberry leaf was significantly ( $p < 0.05$ ) impacted by process variables. The  $R^2$ , Adjusted  $R^2$ , and Predicted  $R^2$  values in the study are high, showing a significant relationship between the independent variables and the Response. The optimal temperature for all three Responses is 65 °C, the optimal solid-to-solvent ratio for total (poly)phenols and anthocyanins is 1:45 w/v and for flavonoids is 28.03 w/v, while the optimal ethanol content in the solvent for total (poly)phenols, flavonoids and anthocyanins is 51.21 vol.%, 50.61 vol.% and 83.33 vol.%, respectively.

**Keywords:** blueberry; ultrasound-assisted extraction; optimization; (poly)phenolic compounds.

---

\*Corresponding author. *E-mail address:* [nebojsa.vasiljevic@tfzv.ues.rs.ba](mailto:nebojsa.vasiljevic@tfzv.ues.rs.ba) (Nebojša Vasiljević)